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REMARKS

Claims 1-18 are pending in this application. Claims 1, 2, 5 and 10-18 are rejected under 35 USC 102 as being anticipated by Burke. Claims 3 and 7-9 are rejected under 35 USC 103 as being unpatentable over Burke. Claims 4 and 6 are rejected under 35 USC 103 as being unpatentable over Burke in view of Stenard.

Discussion of prior art rejections:

As admitted by the Examiner, Burke describes a process wherein a low degree of cold working of the surface (i.e. low stress grinding, EDM or ECM) is mandated in order to avoid recrystallization. This situation is described by Burke at column 11, lines 55-64 as resulting in a condition where a resolidification process occurs as single crystal growth from the base material. This is the condition illustrated as Prior Art in FIG. 1 of the present application. While teaching that it is preferred that that no recrystallization should occur, Burke may be interpreted as allowing for the possibility that recrystallization may occur as a result of a stress level in the surface that is higher than preferred. Thus the Examiner has cited MPEP 2123 for the position that Burke is relevant for all that it contains.

The condition where too much stress is applied to the surface, as suggested by Burke, is also recognized by the present inventors and is described on page 4, line 26 through page 5, line 2 of the present specification. This condition is illustrated in FIG. 4 of the present application. When too much stress is applied to the surface, the recrystallization temperature of the substrate material is reduced to a temperature below the bonding temperature. This allows the grains to nucleate in the substrate surface prior to the onset of melting and resolidification in the joint region. Note, here, the difference between the terms "resolidification" and "recrystallization". Resolidification refers to the hardening of the liquid zone of the transient liquid phase joint. Recrystallization refers to the change of a crystal structure such as by the nucleation of new crystal grains, which can occur in the solid phase. In keeping with the interpretation of Burke under MPEP 2123, the applicants have amended the

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specification and drawing sheet 1 of 2 to acknowledge that FIG. 4 is Prior Art as suggested by Burke. A replacement drawing sheet is attached to this paper.

Accordingly, independent claims 1 and 12 have been amended herein to claim around Burke. Specifically, the claim limitations have been amended to specify that the substrate surface is cold worked to a degree sufficient to cause grains nucleating in a molten region of the consumable insert during the transient liquid phase bonding process to grow into the substrate, and "to a degree less than that which would cause recrystallization of the substrate at or below the bond temperature." Support for these amendments can be found on page 5, lines 21-23 of the specification.

The Examiner has characterized the arguments related to the level of stress as not being recited in the claims because broad terms are used to generally claim the level of cold working. Note, however, that there is no requirement under 35 USC 112, second paragraph, to claim a specific value or range of cold working, so long as the claims particularly point out and distinctly claim the subject matter which the applicants regard as their invention. The recitation of both an upper limit of cold working (a degree less than that which would cause recrystallization of the substrate at or below the bond temperature) and a lower limit of cold working (a degree sufficient to cause grains nucleating in a molten region of the consumable insert during the transient liquid phase bonding process to grow into the substrate) allows one skilled in the art to understand the scope of the invention for any particular embodiment. Accordingly, claims 1-9 and 12-18 are now believed to be in condition for allowance.

Independent claim 10 has also been amended herein for editorial reasons only. These amendments should not be interpreted as being for the purpose of overcoming a rejection and should not be the basis for the narrowing of the scope of equivalents applied to these claims. The applicants find that the rejection of claims 10 and 11 is defective because Burke fails to disclose all of the limitations of either of these claims as originally presented or as amended. Note that claim 10 is directed to the embodiment described in the specification at page 7, lines 1-13 wherein the cold working is performed after the joint has been formed, and the growth of the joint grains is accomplished during a heat treatment conducted separately from the joining process. Burke fails to discuss or even to suggest such process steps. Thus,

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reconsideration and allowance of these claims and of newly added claims 25 and 26 are requested.

Conclusion

Reconsideration of the application in light of the above amendments and Remarks and allowance of claims 1-18, 25 and 26 are respectfully requested.

The Commissioner is hereby authorized to charge any appropriate fees due in connection with this paper, including the fees specified in 37 C.F.R. §§ 1.16 (c), 1.17(a)(1) and 1.20(d), or credit any overpayments to Deposit Account No. 19-2179.

Respectfully submitted,

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